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fats, oils, waxes, and phosphatides; II (116 pp.) to carbohydrates; III (23 pp.) to glucosides; IV (41 pp.) to tannins; V (30 pp.) to pigments; VI (19 pp.) to nitrogen bases; VII (17 pp.) to colloids; VIII (42 pp.) to proteins; and IX (68 pp.) to enzymes. The book is especially written for plant physiologists, and apparently gives the several subjects their proper proportional consideration as demanded by the aim. It is a very simple, direct statement of the cardinal facts of the subject, giving the main methods, chemical and microchemical, used in the field. The avoidance of a technical form of presentation makes the work usable by those of slight chemical training. In discussing chlorophyll, the authors make the barest mention of the older work on the subject, done, as they say, in the main with impure products. The discussion is based on the late work of WILLSTÄTTER and his students, and of TSWETT. This gives in the simplest and most direct way the picture of our present knowledge of chlorophyll. The treatment of chlorophyll is typical of the method of the book and shows one of its great virtues. No mention is made of the important work of IWANOW on metabolism of fats, but this could hardly be expected, since the book deals with little literature of a later date than 1910. The treatise is one that every plant physiologist and probably every botanist dealing at all with the physiology of plants will want on his desk.—WILLIAM CROCKER.

### MINOR NOTICES

**Nigerian plants.**—The British Museum has published<sup>5</sup> a catalogue of the plants of the Oban District of South Nigeria collected by Mr. and Mrs. P. AMAURY TALBOT during 1909 to 1912. The determinations have been made by several specialists, and the collection has proved to be unusually rich in novelties. Of the 1016 species and varieties enumerated, 195 are new, and among them are 9 new genera, as follows: *Alphonseopsis* and *Dennettia* (Anonaceae), *Crateranthus* (Myrtaceae), *Afrohamelia*, *Dorothea*, *Diplosporopsis*, and *Globulostylis* (Rubiaceae), *Scyphostrychnos* (Loganiaceae), *Talbotia* (Acanthaceae), and *Amauriella* (Araceae). The new species are distributed among 31 families, those receiving the largest additions being Rubiaceae (34), Acanthaceae (21), Orchidaceae (20), and Apocynaceae (12).—J. M. C.

### NOTES FOR STUDENTS

**Caprification.**—BAKER<sup>6</sup> has published an interesting study of caprification in a Philippine *Ficus*. On some trees of *Ficus nota* there are produced pear-shaped inflorescences which when mature contain gall flowers and staminate

<sup>5</sup> RENDLE, A. B., BAKER, E. G., WERNHAM, H. F., and MOORE, S., Catalogue of the plants collected by Mr. and Mrs. P. A. TALBOT in the Oban District, South Nigeria. pp. x+157. pls. 17. London: Longmans, Green & Co. 1913.

<sup>6</sup> BAKER, C. F., A study of caprification in *Ficus nota*. Philippine Jour. Sci. 8: Section of Gen. Biol. 63-83. 1913.

flowers. On other trees of the same species only carpellate flowers are found within the inflorescence, although in the latter cases rudiments of stamens sometimes appear. Pollination is effected by means of a new species of *Blastophaga* (*B. nota* Baker), which in its appearance and behavior presents striking differences from the published accounts of the pollination of the fig.

Upon gall-bearing trees of *Ficus nota*, the production and maturing of inflorescences is almost continuous, and the broods of the gall-producing *Blastophaga* constantly overlap one another, thus failing to show the definite seasonal stages of insect and gall as described in the case of the Smyrna fig. A short time before the opening of the staminate flowers in the gall-fig or caprifig, the wingless males of *Blastophaga* emerge from some of the galls within the inflorescence. These males immediately begin gnawing holes into other galls within the same inflorescence, deserting these holes at once when they are found to contain insects other than the females of *Blastophaga*, and copulating with the females when they are present. After copulation the male does not enlarge the opening, thus assisting the female to escape from the gall as has been stated in other descriptions, but it proceeds to gnaw openings into other galls which may or may not contain females of *Blastophaga*. Most of the males die soon after copulation with one or a few females. The females gnaw their way out of the galls which inclose them. The interior of an inflorescence soon becomes an active mass of winged females of *Blastophaga*, and of insects of several other genera which mature within the gall at the same time. The stamens mature at this time and dehisce naturally (not cut open by the male *Blastophaga* as described for other species of *Ficus*), and the bodies of the females become dusted with pollen. The scales which have kept the inflorescence closed against the escape of the insects up to this time now wither and the females escape. Some of these females fly to younger inflorescences upon the same tree or upon similar gall-bearing trees and enter the inflorescences. In the young gall-forming inflorescences the carpels are of such form that the insect can insert the ovipositor into the funnel-shaped stigma and place the egg within the ovary of the carpel. When this has been done the conditions are supplied for the development of new galls. But when these females fly to trees upon which are the inflorescences which produce ripened figs, the story is different. In the inflorescences of these trees the styles and stigmas are of such form that the insects cannot place their eggs within the ovary, and the females run about within the inflorescence, finally dying without having placed their eggs within the ovaries of the flowers. But meantime, as they have moved about within the inflorescence the insects have placed upon the stigmas the pollen which they brought from the gall figs or caprifigs. Fertilization, seed formation, and ripening of the figs follow.

BAKER finds not only this new species of *Blastophaga*, but one new genus and five new species of parasitic insects accompanying *Blastophaga* in infesting the inflorescences of *Ficus nota*.—O. W. CALDWELL.